

Wilmington and Northern Repair Shop, 1883
Beech Street at the Pennsylvania Railroad
Viaduct
Wilmington
New Castle County
Delaware

HAER DE-13

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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD

WILMINGTON AND NORTHERN REPAIR SHOP

HAER DE-13

Location: Beech Street at the Pennsylvania Railroad viaduct in Wilmington, Newcastle County, Delaware.
UTM: 18.451550.4398350
Quad: Wilmington South.

Date of Construction: 1883

Present Owner: Conrail

Present Use: Virtually unused; houses track section gang.

Significance: The Wilmington and Northern Railroad built this small repair facility at a time when Wilmington's business community had visions of recapturing its old markets in the agricultural hinterland of Southwestern Pennsylvania. The shop and the activities which took place here were typical of the many small railroads in the country. In tracing the later history of this building, it is possible to see the history of America's East Coast railroads in microcosm.

Historian: Bruce E. Seely, 1976.

It is understood that access to this material rests on the condition that should any of it be used in any form or by any means, the author of such material and the Historic American Engineering Record of the National Park Service at all times be given proper credit.

In the 1860s, Wilmington, Delaware attempted to recapture some control of the agricultural hinterland of southeastern Pennsylvania, an area which had supplied the city's flour mills in the colonial and revolutionary periods, but which Philadelphia had come to dominate by 1800. In order to facilitate trade with southeastern Pennsylvania, a citizen's committee in Wilmington decided in 1860 to build a railroad line to Chadds Ford, Pennsylvania. It took six years of talk before a viable company was formed, the Wilmington and Reading Railway Company. This line built its track to Birdsboro, Pennsylvania by 1870, [1] but did not reach Reading until 1874. [2] [Photo DE-13-5] A reorganization in 1876 changed the company's name to the Wilmington and Northern Railroad, [3] and under new management the railroad proceeded in a reasonably profitable manner.

In 1883, the railroad decided to build a new repair shop in Wilmington. This shop replaced the one built in Coatesville, Pennsylvania in 1873 by the Wilmington and Reading. [4] The Sixth Annual Report of the company stated, "It is proposed to begin the erection of repair shops at Wilmington in the early spring, on a large and advantageously situated lot owned by the company." [5] The move came as part of the relocation of all Wilmington and Northern office from Coatesville to Wilmington. It cannot be determined exactly when construction began, but on 8 May 1883, the West Chester Daily Local News stated, "Repair shops will be erected shortly in Wilmington. . . ." [6] By the middle of November, the building was completed, and the West Chester paper announced the transfer of employees from Coatesville to Wilmington. [7]

The 1883 Wilmington and Northern repair shop is a brick structure with timber roof trusses and a wooden roof. [Photos DE-13-1,2] It has three main sections: an enginehouse, carpenter shop, and blacksmith shop. (After 1901, a boiler room was added to the front corner of the enginehouse.) The repair shop is a small, unimposing structure compared to the repair shops of larger railroads. Nevertheless, this structure once provided all the service necessary to keep a steam railroad in operation.

The busiest part of the structure was the enginehouse. [Photo DE-13-3] Three tracks enter this section on the east side. Each track has an inspection pit which runs nearly the width of the building, [Photo DE-13-4] and two of the pits carry drop tracks which allowed for wheel and axle work. A monitor runs the length of the roof for ventilation. Illumination was provided by many windows; the few electric lights in the building were entirely inadequate by themselves. Heating was non-existent until a series of steam radiators was mounted on the wall about 1940. Another later installation was the asbestos panels mounted on the ceiling joists directly over the tracks as a fire prevention measure. Work benches lined the south wall and were scattered along the other walls as well. [8]

The north end of the enginehouse contained an adequately equipped machine shop. There were as many as 4 engine lathes of various sizes in the shop at the same time, and a 78-inch tire lathe. The enginehouse held a metal planer, a 15-inch crank shaper, a 48-inch vertical boring mill, emery wheel grinders, several drill presses, a bolt cutter and a bolt threader. A crank pin press, rod bushing press, boiler plate punch, 2 steam hammers and a pipe cutter completed the shop's inventory. Significantly, almost all of the machinery was purchased from local companies in Wilmington or Philadelphia; the famous New England tool makers were little represented. Overhead shafting powered the machines; a vertical steam engine drove the shafting until an electric motor was introduced. Later machine tools were driven by individual electric motors. [9] With its complement of machine tools, the shop performed a great variety of repairs, as evidenced by the Twentieth Annual Report for the year 1896:

Some of the more important renewals to locomotives made during the year comprised two driving axles, 25 steel tires, 17 crank pins, 7 pistons, 3 jackets, 4 boiler coverings, 34 rod brasses, 3 cross-heads, 2 pilots, 3 valves, 4 valve stems, 3 ash pans, 4 smoke stacks, 2 cylinders, 9 cylinder heads, 2 cylinder head covers, 87 driving springs, 14 truck springs, 18 tank truck springs, 46 tires turned, 255 fire bricks, 47 packing rings, 123 sets metallic packing, 32 tank truck brasses, 5 steam chest covers, 4 eccentrics, 2 eccentric straps, 7 cross-head gibs, 39 truck brasses, 16 water bars, 636 flues pieced, 379 new flues, 65 truck and tender wheels, 2 driving wheel centers, 18 driving spring saddles.

During the year 102 cars of all descriptions have received general repairs, and 2,890 slight repairs. In the cars repaired are included a large number belonging to foreign roads. One hundred and seventy car wheels and thirty car axles were also renewed. [10]

The repairs noted in the 1896 report were still being performed in this facility as late as 1940. George Palmer Lerch, a retired general foreman who worked at the repair shop from 1935 to 1961, examined the 1896 list. Lerch noted only 2 jobs that he could not remember doing. [11] One of these was turning tires. Lerch could only remember renewing tires which had already been turned at the Reading Shops and shipped to Wilmington. The same was true of renewing car axles. The Reading Shops shipped the car wheels and axles as units to Wilmington, ready to be installed. [12] But other than these heavy machining operations, Wilmington, according to Lerch, continued to handle all [his emphasis] steam locomotive repairs.

To perform these repairs, a number of lifting devices were used. Over the two pits with drop tracks were trolleys running on I-beams which carried blocks and tackles for lifting objects out of the pits.

Lerch also can remember 2 hand-cranked, mobile cranes with short jibs, mounted on 4-wheel trucks. Many jacks were used, some capable of lifting 100 tons, although most were 50 or 75 ton capacity. Finally, there were a number of carts and dollies for moving parts, materials, and wheels. [13]

The drop tracks used to facilitate wheel, axle, spring, and journal box work still survive. They are simple affairs: a short section of track on each side of a work pit that could be completely removed. These track sections were wedged into place on top of a stack of ties which descended into the pit. A locomotive in need of axle work, for example, ran into the enginehouse and stopped in a position where the axle to be dropped was centered on the removable track sections. The axle was jacked up enough to take the weight off the track; the wedges were removed, and the ties taken out. Then the rails were pushed aside and the axle jacked down into the pit, so that repairs could proceed.

The center of operation was the blacksmith shop, equipped with at least two forges and a steam hammer. The original hammer, dated circa 1870, was retired in 1928 and evidently replaced by one built in 1883 by William Sellers. But by the time George Palmer Lerch started work in 1935, no blacksmith was employed and the forges were used mainly for heating and installing babbitted bearings. Sometime in the late 1940s [14], all but one forge was torn out and a cinder block partition was erected to build a shower room.

The car shop was the third section of the building. A long structure with a dirt floor, 2 tracks enter its doors from the east. Like the enginehouse, monitors on the roof provided ventilation. Lerch said that during his time this building was used only for emergency repairs and storage. But both he and the present caretaker of the site called it the carpenter shop and said that the Wilmington and Northern built passenger cars here. [15] Today, there is nothing in the shop to indicate such an operation, and it would seem unlikely that Wilmington and Northern actually built its own passenger cars, because Wilmington was a major center of commercial car-building. It is known that the company built some of its own freight cars in the Coatesville shop in 1879 [16], but there is no proof that passenger cars were built here.

Even if the company did not build cars here, it did repair large numbers of them. This was an important place for both car repairs and inspections, as shown by the 1896 report mentioned above.

During the period of the Wilmington and Northern the building also housed a wrecking train [Photo DE-13-6]. The right of way to Birdsboro followed a twisting course along Brandywine Creek, and derailments were frequent, as recounted by the Daily Local News.

After one accident the paper reported, "Levers, pipes, wheels, etc., were strewn around everywhere and the tank of the engine was badly broken. The Wilmington wreck train was soon on hand, loaded the remains, and took them to Wilmington." [17] The important point is the special reference to the Wilmington wreck train; it had to be based at the repair shop. [18]

If the period of the 1930s and early 1940s was typical of the tempo of the shop's activity, this was always a busy place. A 1942 photograph shows at least 6 engines at the building. [Photo DE-13-7] When Lerch arrived in 1935, and for some years thereafter, the shop serviced Baltimore and Ohio Railroad locomotives (to the tune of \$3,500 a month in repair charges), [19] and locomotives from another Reading line, the Atlantic City Railroad, were also serviced. [20]

But changes began to occur when diesels replaced steam locomotives. This shop, lacking heavy cranes, was unequipped for performing major repairs on the larger, heavier diesels. [21] The Reading Railroad, then the owner of this shop, began introducing diesels very early in the 1940s. By 1952, when the Reading replaced its last steam locomotives, engine repairs had ceased at Wilmington. Daily and monthly maintenance were performed here for diesels, and emergency repairs, but that was all. Car repairs continued as before, with heavy car repairs being made right up to 1960. But all through the 1950s, machinery was scrapped or sent to Reading. And in the 1960s, only light repairs and car inspections were handled here. The number of men employed declined. In 1883, the railroad transferred 45 men from Coatesville to man the new shop in Wilmington. [22] George Palmer Lerch remembered 30 men working here in 1935. [23] By 1954, the number had dropped to 15, [24] and by 1976 the structure had fallen almost completely into disuse. [25] The structure was in a very dilapidated state. The enginehouse was a shell; one section of the roof had collapsed and the windows were all boarded.

The history of this building is, in microcosm, the history of America's east coast railroads. The structure was part of a local attempt to promote trade, and it serviced a small railroad's cars and engines. Absorbed into a larger company (the Reading,) it was an integral part of its system, although it lost some repair functions to a larger, newer, central repair facility. The decline started with the introduction of the diesel locomotive, a machine beyond the repair capabilities of this shop. With less frequent use, its machinery was removed, its steam-related facilities torn down, [26] and its manpower reduced. For a while, its importance as a car shop remained, but soon this function, too, declined. The final demise came with the financial collapse of the railroads in the 1960s when even routine building maintenance was neglected. In 1976, the repair shop was part of the Conrail system, virtually unused. It remained a dilapidated relic of the age of steam, to which it belonged, as much as any water tower or coaling bin.

NOTES

[1] See map of the railroad, photocopy, First Annual Report (Reading Company, 1898).

[2] History of the W. & N. Railroad, (n.a., n.d.); Typescript copy from G. P. Lerch, copy in appendix.

[3] J. Thomas Scharf, History of Delaware, 1609-1888 (2 vols.; Philadelphia, 1888), V. I, p. 432; and Report, Purchasers of the Wilmington and Reading Railway, (Philadelphia, 1877).

[4] "The Company have 5 acres of land, one mile south of Coatesville upon which the temporary shops have been erected, and the necessary machinery is now being put in to enable the Company to do its own repairs." Hugh Steele, President of the Wilmington and Reading Railway, Letter to stockholders, 7 May 1873.

The Wilmington and Reading also had a facility in Wilmington, labeled as an "enginehouse" by an 1876 survey. The atlas shows a rectangular structure with 4 tracks entering the building, and a turntable. The building stood directly behind the present oil and store house. Another atlas shows both features still standing as late as 1887. By 1901, only the enginehouse was present. According to a Reading Company plan dated January 24, 1924, the building was to be demolished that year. C. M. Hopkins, City Atlas of Wilmington, Delaware (Philadelphia, 1887); G. Wm. Baist, Property Atlas of the City of Wilmington (Philadelphia, 1901); Reading Company plans, copied in appendix.

[5] Wilmington and Northern Railroad Company, Sixth Annual Report, 1882, p. 10.

[6] West Chester Daily Local News, 8 May 1883.

[7] Ibid., 12 November 1883.

[8] Oral interview, George Palmer Lerch, 29 June 1976. Hereafter cited as CPL interview.

[9] This material is compiled from machinery lists of the Reading Company. These lists date no earlier than 1914 and most likely from the 1920s. Having been amended repeatedly, they are difficult to read. A compilation of all the information contained in the lists, including dates and manufacturers of the various machines, is in the appendix. Obviously, the machines listed are only those in the shop at the time of compilation. The floor plan drawing shows the placement of the machinery within the building as remembered by C. P. Lerch, retired general foreman, and James Cooper, retired machinist.

[10] Wilmington and Northern Railroad Company, Twentieth Annual Report, 1896, p. 10.

The list of repairs for 1887 is as follows:

Besides the ordinary repairs, three passenger engines, five freight engines, and two shifting engines have received general repairs, and an extension front has been added to one locomotive. Some of the more important renewals to locomotives made during the year comprise 4 driving axles, 4 steel tires, 6 crank pins, 5 injectors, 7 pistons, 1 jacket, 4 boiler laggings, 12 rod brasses, 5 crossheads, 9 pilots, 3 valves, 1 valve stem, 9 driving boxes, 1 ash pan, 4 smoke box doors and frames, 7 smoke stacks, 1 cylinder, 8 cylinder heads, 6 cylinder covers, 32 driving springs, 18 truck springs, 16 tank truck springs, 1 tank frame, 2 extension fronts, 1 fire box, 1 steam chest, 1 eccentric, 1 eccentric strap, 1 back boiler head, 1 steam box, 2 pump plungers, 3 spark arresters, 100 packing rings, 172 pieces of fire brick, 3 main reservoirs, 4 eight-inch air pumps, 9 water bars, 20 grate bars, 1 valve yoke, 2 valve seats, 34 drawheads, 23 bumpers, 2 inside sheets in firebox, 2 sets new flues, 2 tank trucks, 3 crosshead gibs, 71 staybolts, 26 tires turned, 4 Janney Truck Couplers and buffers, 122 truck and tender wheels and 5 truck axles.

During the year 28 cars of all descriptions have received general repairs, and 996 slight repairs. In the cars repaired are included a number belonging to foreign roads. Ninety-six car wheels and 24 car axles were renewed.

Wilmington and Northern Railroad Company, Eleventh Annual Report, 1887, pp. 11-12.

[11] G.P.L. Interview.

[12] Photographs from G. P. Lerch show the area where the wheel and axle units were stored after coming from Reading. A hand crane loaded and moved the wheels onto a short storage track. Area is no a parking lot, behind the oil and store house.

[13] G. P. L. Interview.

[14] Perhaps 1947. The machinery list says the Sellers steam hammer was shipped to the "Reading Engine House" 12 July 1947.

[15] G. P. L. Interview.

[16] West Chester Daily Local News, 23 October 1879.

[17] Ibid., 14 September 1885.

[18] G. P. Lerch provided a photograph dated 1900 which shows the wreck train on the line, which had become part of the Philadelphia and Reading by that time. The caption reads, ". . .enroute to Wilmington." Even at that time, then, the wreck train was based in Wilmington.

[19] G. P. L. Interview. Confirmed by Hugh Gibb, Specialist, Industrial Collections, Eleutherian Mills-Hagley Library.

[20] Hugh Gibb, Eleutherian Mills-Hagley Library.

[21] The important thing to remember is that the locomotives used on this line were not very heavy. Even in the 1930s the Reading used very small engines on this line. Pictures provided by Mr. Lerch show 0-4-0 and 0-6-0 switchers at the building. The largest shown is a 2-8-0 camelback engine. These light engines could be serviced without elaborate cranes.

[22] West Chester Daily Local News, 12 November 1883.

[23] G. P. L. Interview.

[24] Oral Interview, Walt Underkoffler, present caretaker of the site, 29 June 1976.

[25] According to Walt Underkoffler, in 1976 an emergency car repairman worked out of the shop, and it housed a track section gang and served as a garage for their truck.

[26] A coal trestle, turntable, water plug, and various other outbuildings are shown on the Reading Company plans. They were torn down early in the 1950s.

Reading System

Machinery List, Wilmington and

Northern Repair Shop, c. 1920

Date Built	Size-Description-Manufacturer	Net Weight	Orig. Cost	FOB Point	Cost Reprod. 1914	Remarks
	<u>LATHES</u>					
1885	16" x 6' 0" Engine F. E. Reed	E 1835	E 400	Phila.	400	Scrapped 12/9/1957
1873	26" x 16' 0" " E. A. Betts	E 7000	E 950	Wilm.	950	Retired 1952
1896	14" x 8' 0" " Windsor Mach. Co.	E 1300	E 150	"	325	Retired 3/29/1936
1873	14" x 6' 0" " Fitchburg Mach. Co.	E 1350	E 325	Fitchburg	325	Retired, scrapped, 4/1927
1907	78" Tire Bement-Miles Co.	E 3500	E 2800	Phila.	2800	Retired, 7/8/1935
1905	20" x 10' 0" Engine Putnam & Son	5200	571	---	---	Separate Electric Motor
	<u>METAL PLANER</u>					
1873	32" x 36" x 7' 6" E. A. Betts	E 9000	E 1300	Wilm.	900	Retired 3/31/1952
	<u>SHAPERS AND SLOTS</u>					
1885	Shaper--15" Crank Gould and Eberhart	E 2000	E 400	Phila.	400	
	<u>VERTICAL BORING MILLS</u>					
1907	46"--2 hds. on Cross Rail Colburn Mech. Tool Co.	E 12000	E 1800	Franklin	1900	Retired 1952
	<u>GRINDERS--ALL KINDS</u>					
1896	3" x 12" Double Emery Penn. R.R.	E 675	E 75	Unknown	75	Purchased second-hand, removed 1/17/1937.
1913	6" x 36" Grindstone " " and Stand	E 550	E 44	Wilm.	46	
---	3" x 12" Double Emery " "	---	---	---	---	From East Penn
	<u>DRILL PRESSES</u>					
1886	18" Swing- 1/4" to 1 1/2" holes, Post C. Ridgway and Son	E 200	E 75	Coatesville	75	Scrapped, 4/ 1927
1873	4' 0" Radial Hilles & Jones	E 5000	E 1300	Wilm.	750	Retired, 3/29/1936
1905	36" Radial-Motor Drive ---	E 4000	---	---	---	From Reading, 3/1936
1905	14" x 10"-Cl. Table-Sensitive ---	E 350	E 69	---	---	From Reading, 8/1935
	<u>BOLT, NUT & STAYBOLT MACHINERY</u>					
1873	Bolt Cutter-1/2" to 1 1/4" Single Head Babbitt & Hickey	E 500	E 200	Auburn	200	Scrapped, 4/1927
1927	Bolt Threader- 1/2" to 2", #736M-Greenfield	2551	897.48	Greenfield Mass.		3 H. P. Motor

Reading S. Hem

Machinery List, Wilmington and

Northern Repair Shop, c. 1920

Date Built	Size-Description-Manufacturer	Net Weight	Orig. Cost	FOB Point	Cost Reprod 1914	Remarks
	<u>HYDRAULIC PRESSES</u>					
1882	100 Tons-Crank Pin Press on 4 wheel truck Watson & Stillman	E 1600	E 250	Phila.	250	To Reading, 8/4/1927
1929	75 Ton-Rod Bushing Press-Birdsboro	E 9700	1805.3	Birdsboro		From Reading, 3/29/1936 Scrapped, 12/9-1957
	<u>SHEARS AND PUNCHES</u>					
1896	Punch-Boiler Plate-12" Throat 1/2" to 1/4"-Single End-Betts Mach.	E 4200	E 200	Wilm.	300	Scrapped, 4/1927
	<u>STEAM HAMMERS</u>					
E1870	1200# Drop Unknown	E 6000	E 150	Phila.	350	Purchased second-hand In Blacksmith Shop Retired, 6/11/1928
1883	650# Single Frame Wm. Sellers	8900	1000	Phila.	---	Retired, 7/12/1947
	<u>MISCELLANEOUS MACHINERY</u>					
1886	Pipe Cutter-3/4" to 3"-Armstrong Co.	E 150	E 125	Wilm.	125	Retired, 1952
---	Air Compressor ---	---	---	---	---	Installed, 7/1939 Shipped to Reading Locomotive Shop, 1/27/1960
---	American Blower Vertical Steam Engine	---	---	---	---	Retired, 7/23/1946 Removed to Reading Storehouse, 8/19/1946
	This is a composite of 3 Machinery Lists obtained from the office at the Wilmington and Northern Repair Shop. Originals are almost illegible blue line copies.					

SOURCES

Reading Company, First Annual Report, 1898.

Provided map of the line from Wilmington to Reading. In the Eleutherian Mills-Hagley Foundation Library.

Reading Company, assorted maps and plans of the property. Provide data on the location and the dates of changes to buildings on the property. Copies with report.

Report, Purchasers of the Wilmington and Reading Railroad, Philadelphia, Allen, Lane & Scott's Printing House, 1877. Describes the reorganization of the W. & R. into the W. & N. and the terms of the bonds.

Scharf, J. Thomas, The History of Delaware, 1609-1888, 2 vols., Philadelphia, L. J. Richards & Co., 1888.

Steele, Hugh, President of the Wilmington and Reading Railway, Letter to Stockholders, 7 May 1873. Information of the Coatesville Repair Shop. In the Chester County Historical Society.

West Chester Daily Local News. Clipping file at Chester County Historical Society on W. & N. events.

Wilmington and Northern Railroad Company, Sixth, Eleventh, and Twentieth Annual Reports, 1882, 1887, and 1896. Have information on the operation of the road and useful material on the types of repair performed in the shop. In the Hagley Library.

ORAL INTERVIEWS--all untaped

James Cooper, retired machinist, 15 July 1976.

Mr. Cooper helped place the machinery in the building for the floor plan.

Hugh Gibb, Specialist, Industrial Collections, Hagley Library.

Mr. Gibb was able to provide some background on the Reading Company and some specifics on the repair shop.

George Palmer Lerch, retired general foreman, 29 June 1976 and 15 July 1976.

Mr. Lerch was able to describe the activities of the repair shop from 1935 onward, and to help place the machinery in the shop.

Walt Underkoffler, caretaker of the site, summer 1976.

Mr. Underkoffler was able to discuss the present activities of the building and found the company plans and maps of the site.

ATLASES

Baist, G. Wm., Property Atlas of the City of Wilmington, Philadelphia, 1901.
_____, Atlas of the City of Wilmington, Philadelphia, 1887.
Hopkins, G. M., City Atlas of Wilmington, Philadelphia, 1876.
Sanborn Map Company, Insurance Maps of Wilmington, New York, 1927,
Amended 1928, 1943, 1946, 1954, and 1956.

All the maps and atlases helped to trace the changes of buildings at the repair shop. All are located in the Hagley Library.

GENERAL INFORMATION ON THE
WILMINGTON AND NORTHERN RAILROAD

History of the W. & N. Railroad, (n.p., n.d.).

Unpublished typescript of 2 pages with short history of the company from 1860 to absorption by Reading Railroad. Copy in Appendix. Also in Historical Society of Delaware and Chester County Historical Society.

Scheffey, William M., "Wilmington & Northern Railroad", article in Historic Brandywine Guidebook, 1961, pp. 25-29.

The Wilmington & Northern Railroad, Downingtown, Charles A. Elston, 1946. In Chester County Historical Society and Historical Society of Delaware.

Wilmington & Reading Railroad Guide, Jenkins and Atkinson, Wilmington, 1870. In Historical Society of Delaware.